III. CLAIM AMENDMENTS

1. (Currently Amended) Light-refracting, color-enhancing compositions ~~for applying coatings to a substrate comprising~~ consisting essentially of a mixture of (a) pelletized microparticles of rubber having a diameter up to about 150μ and (b) transparent or translucent glass [[plastic]] beads having a diameter up to about 20 [[70μ]] and (c) a resinous binder material which cures to form a hard, translucent, light-refracting [[paint]] layer.

2. (Currently Amended) A [[coating]] composition according to claim 1 in which the beads have a maximum diameter within the range of about 10 to 20 microns.

3. (Currently Amended) A [[coating]] composition according to claim 2 in which the maximum diameter is between 12 and 18 microns.

4. (Currently Amended) A [[coating]] composition according to claim 1 in which the beads are clear glass and have a refractive index between about 1.5 and 2.5.

5. (Currently Amended) A [[coating]] composition according to claim 4 in which the refractive index is between about 1.9 and 2.1.

6. (Currently Amended) A [[coating]] composition according to claim 4 in which the glass beads comprise a mixture of beads having different refractive indexes.

7. (Currently Amended) A [[coating]] composition according to claim 1 in which the pelletized rubber particles have a diameter [[up to]] of about [[150μ]] 120μ.

8. (Currently Amended) A [[coating]] composition according to claim 1 in which the pelletized rubber content is between about 2% and 40% by weight.

9. (Currently Amended) A [[coating]] composition according to claim 1 in which the binder material comprises a mixture of a pre-polymer having reactive sites, and a poly-functional cross-linking agent which is reactive with said sites to cure the binder material.

10. (Currently Amended) A [[coating]] composition according to claim 1 comprising a paint coating in which the resinous binder material contains a volatile solvent or vehicle which is evaporated to dry the coating below the baking temperature of the paint composition.

11. (Original) A coating composition according to claim 10 in which the volatile solvent is an organic solvent, and the coating composition has a solids content above about 60%.

12. (Original) A coating composition according to claim 10 in which the volatile vehicle is water.

13. (Original) A coating composition according to claim 1 in which the glass bead content is between about 10-20% by weight of the composition.

Claims 14-17 (Withdrawn).

IV. REMARKS

The present amendments to the specification and claims clarify the intention that the present application is not limited to coating compositions such as for paint layers. The present compositions can be sprayed or cast to form light-refractive resinous bodies as disclosed, for example, on page 1, line 16 and page 5, line 25 of the present specification.

The present invention is disclosed in the Summary of the Invention on page 4 of the present specification and comprises improving the binding properties of sub-20 micron glass microbeads for their resinous binder material compositions and for improving the bonding properties of such compositions for substrates to which they are applied. The invention involves the unexpected discovery that such novel binding and bonding properties can be produced by the addition of microparticles of ground rubber up to about 150μ in size to resinous compositions containing glass microbeads having a diameter of up to about 20 microns.

Referring to the Office Action, paragraphs 2 and 3, the present specification has been amended at page 5 to capitalize the trademark "RELASTON" at line 2 and at page 7, line 12 to insert reference to the preferred microbead size range given originally in claim 3.

Referring to paragraphs 6 and 7 of the Office Action, the specification and claim 1 have been amended to delete reference to "plastic" beads from the specification at page 1, line 25, and from generic claim 1.

Reconsideration of the rejection of the claims 1 to 5 and 7-13 in paragraphs 9-11 of the Office Action as being obvious from the combination of the PPG (WO 00/75242) in view of Tanaka et al. WO 97/48772 as translated in U.S. Patent No. 6,340,519 is respectfully requested.

The PPG published application relates to retro-reflective coating compositions such as automotive paints, containing glass microbeads. Such compositions are of the type referred to in the prior art discussed in the present specification at page 1, line 23 to page 4, line 16. The PPG reference teaches no awareness of the binding and bonding problems solved by the present invention, and makes no reference to the incorporation of ground rubber microparticles for any purpose.

The Tanaka et al. Reference relates to heat-expandable under coating compositions characterized by the incorporation of thermoexpandable plastic microspheres which enable thin undercoatings, such as 100-1000μ thick, to be baked to form chip-resistant thick expanded coatings which are 200-5000μ thick - see col. 6, lines 62-67. The compositions contain 20 to 80 wt% of a chipping resistant material which may be glass beads of 5-50μ size. An optional reinforcing material may be included, such as rubber powder of 0.1 to 150μ particle size.

The formed under coatings are thick, porous with many hollows, and are flexible or elastic, see col. 3, lines 30-32. This is what is referred to in the reference as "chipping - resistance".

As in the PPG reference, there is no teaching in the Tanaka et al. Reference showing any awareness of the problem of improving the binding properties of glass microbeads in their resinous compositions or of the problem of improving the bonding

properties of glass bead - containing resinous compositions for supporting substrates such as automobile bodies. Glass microbeads are not essential ingredients of the Tanaka et al. undercoating compositions, merely one of several "cushioning materials" disclosed at col. 4, lines 61 to 65. Similarly, rubber particles are not essential ingredients of the Tanaka et al. undercoating compositions, merely one of several "reinforcing materials" disclosed at col. 5, line 64 to col. 6, line 3. The likelihood of selecting the use of the combination of glass beads and rubber particles in the Tanaka et al. undercoatings, from all of the other possible combinations, is similar to the chance of selecting the correct combination of numbers to open a combination lock or to win a lottery. Not one of the Examples 1 to 12 or comparative Examples 1 to 4 contains either glass spheres or rubber particles. The selection of either glass spheres or rubber particles, particularly the combination thereof, could only be made as the result of hindsight in view of the present disclosure.

There is nothing in the Tanaka et al. reference which would lead one skilled in the art to use the rubber particles of Tanaka et al. in the PPG compositions to improve the binding properties of the glass microbeads in the resinous compositions of PPG, or to improve the bonding properties of such compositions for the substrate.

The Examiner has rejected claim 6 as being obvious from the combination of PPG and Tanaka et al. in further view of either DeMaster or Nakajima. As discussed above, the PPG and Tanaka et al. references do not teach or suggest compositions containing a mixture of glass beads and rubber particles, to improve the binding properties of the glass beads and the bonding properties

of the composition for substrates. The DeMaster and Nakajima patents do not make up for the deficiencies of the PPG and Tanaka et al. references in teaching or suggesting the compositions of the present invention.

In paragraph 14 of the Office Action the Examiner has rejected claims 1-5 and 7-13 as being obvious from the Bridgestone Corp. reference in view of the PPG reference.

The Bridgestone Corp. reference relates light-reflective road paint compositions containing large diameter glass beads, 100μ, and rubber particles to impart skid-resistance for traffic. The compositions are heat-meltable and require the presence of large glass leads which reflect back the light from headlights. The rubber particles are not disclosed to improve the binding properties of the beads in the composition or to improve the bonding properties of the molten composition for the road surface.

The present compositions differ substantially from those of the Bridgestone Corp. reference in many respects. The present compositions cure to form a hard light refracting layer. The compositions of the Bridgestone Corp. reference solidify on cooling and form light-reflective coatings. As disclosed on page 12, lines 18-24 of the present specification, the present compositions cure during heating or exposure to ultraviolet to a clear, hard, glass-like condition. As disclosed on page 18, lines 1-11 of the present specification, the present compositions form layers which are not reflective. To the contrary the present compositions are light-refracting so that they scatter and diffuse light horizontally through the layer due to the sub-20μ bead size, particularly with beads having different refractive indexes - see also page 6, lines 29-34 and page 7,

lines 1-18. The present compositions are more similar to those of the PPG reference but there is no teaching or suggestion in the Bridgestone Corp. reference which would lead one skilled in the art to add the friction-improving rubber particles of the Bridgestone Corp. reference to the compositions of the PPG reference to improve the binding properties of sub-20 microbeads or to improve the bonding properties of the PPG compositions for their substrate, except as a result of hindsight in the light of the present disclosure. Therefore, reconsideration and withdrawal of the rejection based upon the combination of the PPG and Bridgestone Corp. references is respectfully requested.

Finally withdrawal of the rejection of claim 6 based upon the above combination of references in further view of DeMaster or Nakajima is respectfully requested. These latter references do not teach or suggest the addition of rubber particles to a glass bead composition to improve the binding properties of glass beads within the composition or to improve the bonding properties of the composition to a substrate. Only the Bridgestone Corp. reference discloses the addition of rubber particles to compositions containing large 100μ glass beads in order to impart friction properties for skid resistance. This has no pertinence to the present invention. Where, in any of the references or in any combination thereof, is it obvious to incorporate rubber particles into glass microbead compositions in order to improve the binding properties of the glass beads for their composition, and/or to improve the bonding properties of glass microbead compositions for a support such as an automotive body? It is respectfully submitted that such incorporation could only be made as a result of hindsight in the light of the present disclosure.

Reconsideration and allowance are respectfully requested.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,

7/27/04
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